European
Commission

CORDIS Results Pack on
energy efficiency
and behavioural change

A thematic collection of innovative EU-funded research results

September 2020

Reducing carbon footprint through ICT and sustainable actions

Research and Innovation

Contents

Editorial

The fact that there is an untapped potential for energy savings that could be harnessed by changing energy habits and behaviour inside buildings is widely accepted. Yet, the human dimension of energy use in buildings is often insufficiently considered, and behavioural triggers are not well understood. In this context, ICT tools can help consumers better understand their energy use and manage their energy consumption while achieving significant energy and economic savings, without compromising comfort. In this Results Pack, we meet a number of innovative EU-funded projects that demonstrated efficient, cost-effective and socially acceptable technology solutions that motivate consumers to engage in basic energy-saving behaviours.

Targeting consumers' behaviour is key to promoting energy efficiency in buildings. To make any inroads in energy cuts, it is important to help people understand why and how homes, workplaces and businesses need to be improved to make better use of energy. Making energy more tangible can also work well as a strategy: consumers get very little feedback about the direct consequences of leaving a light on when they leave a room or keeping their thermostat on high when they are away.

'Dumb energy', squandered carelessly, could be replaced by 'smart energy', enabled by ICT solutions. It is clear though that the biggest challenge is not to deploy the right technology alone. The real focus should be on trying to influence the 'sensitive realm' of a building; namely, inspire environmental sensitivity and show how much influence and meaning personal choices have in a wider context.

Gamification and serious games could alter old energy habits

Getting people to change their behaviour, especially when it comes to everyday habits, is difficult. This is where games could have a niche. By turning mundane activities into a game, a process called 'gamification', people can obtain rewards for making a positive change.

Gamification can be anything from competitions between neighbours to getting positive feedback for sustainable actions on social media platforms. Competitive energy savings can make individuals feel empowered and achieve long-lasting improvements in buildings.

Serious games, which are more educational by nature, could also encourage people to adopt environmentally friendly behaviours. Connecting serious games to energy data in buildings can offer easy and quick energy savings.

EU-funded projects leading the way

This Results Pack showcases seven EU-funded projects that have developed apps for smartphones and tablets, interactive online tools and serious games that not only raise awareness but also strive to make long-lasting behavioural change as easy as possible.

The EnerGAware project unveiled a serious game called 'Energy Cat: The House of Tomorrow' to build energy engagement in social housing. By buying different items, each player customises their own virtual house, bearing in mind the energetic consequences of these actions. The actual energy consumption of the players' real houses also impacts on the game, thanks to the data collected by a smart meter.

A significant output of the enCOMPASS project has been a hybrid table and digital game called Funergy that increases student awareness on issues related to energy efficiency. The app was gamified to keep high levels of engagement. In a similar vein, the GAIA project created an innovative ICT ecosystem, which includes Internet of Things sensors, data from participatory sensing and a learning system for serious games, tailored to public educational buildings.

MOBISTYLE developed four different ICT-based tools to encourage people to reduce energy consumption through holistic information about the impact of energy-efficient behaviours on personal health, productivity and environmental air quality. Similarly, the InBetween and PEAKapp projects developed smart ICT solutions comprised a cloud-based platform and a mobile app to encourage behaviours supporting energy efficiency and sustainable energy use. The mobile apps also inform consumers about discounts in renewable electricity. Finally, ENTROPY's novel energy IT platform and ecosystem could also bring improvements in energy efficiency of public buildings when driven by a campaign manager.

Energy Cat helps you see the financial benefits of virtual energy-efficient decisions

Educating consumers about the ways they can benefit financially while making their homes more energy efficient could encourage them to adopt more energy-efficient behaviours. A game that lets players design a virtual home and progress based on energy savings makes learning fun.

Energy poverty, the financial inability to maintain indoor thermal comfort, affects between 50 and 125 million European residents. Reducing energy consumption and associated emissions is thus important, not just for the health of our planet, but for the financial well-being of its inhabitants as well. The EU-funded EnerGAware project targeted reducing the energy consumption of low-income households by encouraging behavioural change through a fun and informative game, Energy Cat: The House of Tomorrow".

Nine lives and full of energy

Gamification aims to enhance user engagement and ultimately behavioural modification through learning that is fun and interactive. Its application to energy conservation is an emerging field and EnerGAware is at the forefront. Energy Cat seeks a comfortable and energy-efficient dwelling and advises its
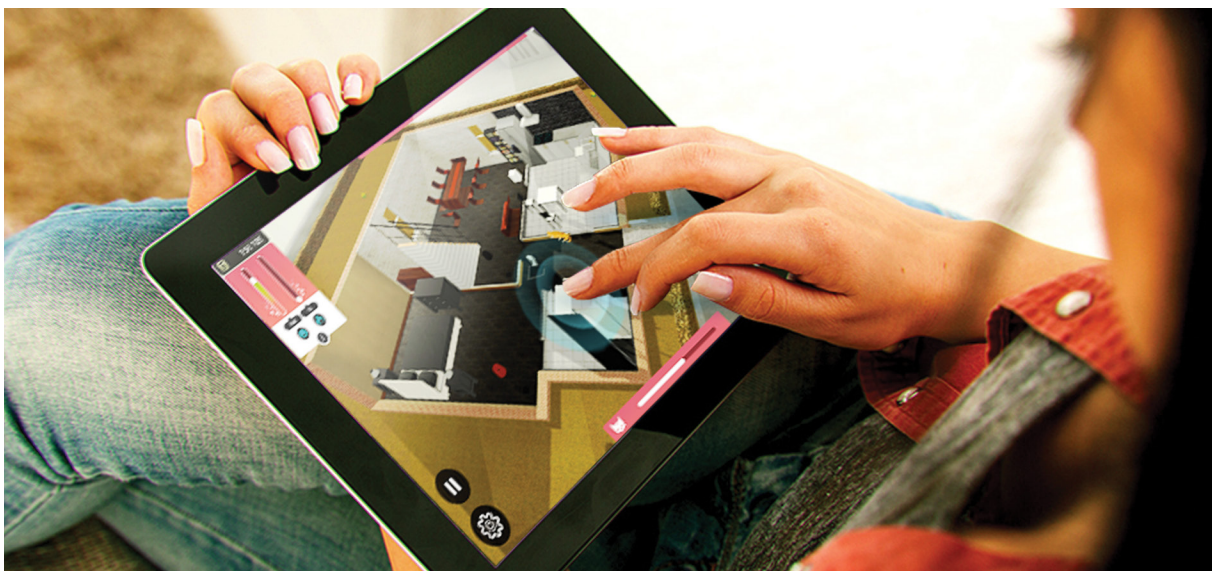
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EnerGAware demonstrates that vulnerable members of society can reduce their energy consumption using ICT. Our game allows citizens to increase their understanding and awareness of energy saving options in residential buildings through successfully balancing energy consumption, comfort and financial cost. By changing users' behaviour, the game contributes to reducing fuel poverty with minimal individual investment.

human housemates when they make poor choices. Social media features enable users to share achievements and knowledge and form virtual energy communities. The game was piloted in a low-income social housing community in the UK.

Miquel Casals, project coordinator and professor at the Technological University of Catalonia-Barcelona Tech, explains: "The player's main objective is to reduce household energy consumption to accumulate energy points corresponding to money. Energy points allow progress in the game, including unlocking decorative and energy-saving items and upgrades." These increase human happiness, leading to higher productivity and greater earnings. 'Money' is also hidden in the house to encourage players to play daily and to check rooms for bad energy 'behaviour'.

Virtual energy savings were calculated by building performance simulation using dynamic thermal simulation software, DesignBuilder powered by the EnergyPlus simulation engine. Smart metering systems measured the actual energy consumption in the real homes. Real energy savings also enabled progression in the serious game.

Moving forward, inspiring change

The Energy Cat serious game led to an average electricity savings of 3.5 % and an average gas savings of 7.5 %. Analysis at mid-trial showed higher engagement in energy-saving behaviours and higher energy savings, so scientists are now addressing improvements to maintain interest over time. Casals explains: "Responses to a final survey and interviews highlighted a potential role of age, education and ICT skills in decreased engagement. Although these parameters were considered at the outset, future versions will enhance support and instructions and reduce game complexity." The EnerGAware serious game was presented as a climate solution during COP21, also known as the 2015 Paris Climate Conference, and at many other energy and sustainability events. It can be found along with other games for energy and smart homes by Fremencorp.

Casals concludes: "EnerGAware demonstrates that vulnerable members of society can reduce their energy consumption using ICT. Our game allows citizens to increase their understanding and awareness of energy-saving options in residential buildings through successfully balancing energy consumption, comfort and financial cost. By changing users' behaviour, the game contributes to reducing fuel poverty with minimal individual investment." Replication of the pilot with the support of national and/or regional energy agencies could help ensure the game is useful and enjoyable regardless of geographic location or socioeconomic environments. If distributed freely by energy providers to energy customers as part of the European smart meter roll-out, the impact on overall energy consumption could be significant.

PROJECT

EnerGAware – Energy Game for Awareness of energy efficiency in social housing communities

COORDINATED BY
Technological University of Catalonia-Barcelona Tech, Spain

FUNDED UNDER
H2020

CORDIS FACTSHEET
cordis.europa.eu/project/id/649673

PROJECT WEBSITE
energaware.eu/

Rationally modulating indoor climate enhances our lives and helps the environment

Modifying people's behaviours can play an important role in decreasing global energy consumption. ICT-based tools that present users with the impact of building or room-specific energy metrics on measures of health, indoor environmental quality (IEQ) and even productivity could be a game changer.

Although plenty of data can now be obtained regarding a building's energy performance, this information is generally not available to residents or other building users. It is also rarely in an easy-to-understand format – few people know how to interpret a decrease in energy consumption expressed in kilowatt-hours. The EU-funded MOBISTYLE project has developed four different ICT-based tools to encourage people to reduce energy consumption through holistic information about the impact of energy-efficient behaviours on personal health, productivity and environmental air quality.

Putting customers first in more ways than one

According to Ana Tisov of Huygen Installation Consultants and project operational coordinator, "a people-centred approach was the key to MOBISTYLE innovations. We developed the ICT tools based on end-user input in preliminary design workshops prior to development. The workshops revealed that our original plan to use augmented reality and 3D models lacked added value for users. Rather, they enthusiastically supported the use of gamified apps and friendly user interfaces to access and understand real energy, health and comfort data." The team modified its game plan accordingly and developed four fun, informative and educational ICT tools demonstrated in case studies across Europe.

Something for everyone, from homes to businesses and building managers

The MOBISTYLE dashboard, piloted in university offices and a hotel, helps users monitor energy performance and IEQ via mobile phone or computer. Tisov elaborates: "At the university, we also used posters, screen messages and an LED air quality indicator throughout the buildings. Use of heating and cooling decreased, as did public elevator use. Interestingly, the LED indicator was associated with more window opening, supporting the important effect simple solutions can have." Use of the MOBISTYLE dashboard was associated with a decrease in cooling use by 13 % and 25 % in two university buildings even though there were more warm days.

MOBISTYLE's office application piloted in open-plan offices focuses on creating a dynamic indoor climate in which a variety

Why should we know less about the buildings in which we spend most of our time than we do about the cornflakes we had for breakfast? By increasing education about the interrelationships among energy usage, IEQ [indoor environmental quality], health and lifestyle, energy conscious and healthy behaviour can become a way of life.

of IEQ parameters are modified throughout the day to enhance comfort, health, mood and productivity. For example, white light enhances alertness and productivity but warmer light towards day's end helps maintain a healthier sleep/wake cycle. The office app shows users the interrelationships among energy use, IEQ and health and productivity.

A gamified app for mobile devices, the MOBISTYLE game, was piloted in social housing apartments and smart homes. Finally, the expert tool supports building managers with data integration, visualisation and simple analyses, and was successfully implemented in all the demonstration cases.

Energising awareness and change for a better future

MOBISTYLE customers can use its ICT tools, store data from its cost-effective sensors in the MOBISTYLE database and use the open-access component of the platform to develop their own apps. Taking advantage of the European Commission's on-demand services for exploiting research results, researchers prepared and discussed plans for commercialisation with the MOBISTYLE Consumers Advisory Board. Tisov concludes: "Why should we know less about the buildings in which we spend most of our time than we do about the cornflakes we had for breakfast? By increasing education about the interrelationships among energy usage, IEQ, health and lifestyle, energy conscious and healthy behaviour can become a way of life."

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PROJECT

MOBISTYLE – MOtivating end-users Behavioral change by combined ICT based tools and modular Information services on energy use, indoor environment, health and lifestyle

COORDINATED BY
Huygen Installation Consultants, the Netherlands

FUNDED UNDER
H2020

CORDIS FACTSHEET
cordis.europa.eu/project/id/723032

PROJECT WEBSITE
mobistyle-project.eu/en/mobistyle/Pages/default.aspx/

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ICT platform to encourage more efficient and sustainable energy-saving behaviour

Buildings represent 40 % of total EU energy demand, but consumption can be reduced up to 20 % by getting people to adopt a more energy-efficient lifestyle. An EU project is developing ICT solutions to encourage such behaviour.

© InBetween

Smart metering technologies and home automation systems have proven effective in changing the behaviour of end users. With this in mind, the EU-funded InBetween project has developed smart solutions for buildings consisting of a cloud-based platform and a mobile app.

"We're going beyond existing ICT technologies used for encouraging behavioural change towards more energy-efficient ways of life," outlines coordinator Donato Zangani. "This is being achieved by assisting users to identify energy waste, learn how they can conserve energy and motivate them to act." Available as a mobile and web browser app, the platform enables users to tailor services to their own needs and preferences without compromising comfort.

Advanced energy services

"A range of services, such as scheduling, timely notifications and benchmarking provide a right mix of socioeconomic and environmental motivations to save energy," observes Zangani. "The actuators and notifications help make energy savings easy and, at times, seamless." Specifically, these services take into account three main energy analytics – current consumption, occupancy and weather conditions – and use competition as a driver to promote energy-efficient behaviour.

The platform monitors users' energy consumption and determines the ideal time to activate a home appliance in order to minimise costs and optimise any potential presence of renewable energy sources like solar panels or wind turbines. "Combining similar consumption data from selected buildings for a given period makes it easier to visually compare time periods and draw conclusions, and to identify suspicious consumption patterns," explains Zangani.

By connecting smart meters to every appliance, the platform provides feedback to household residents on how they spend their energy and which home appliances are in use. A 24/7 monitoring service analyses events in close to real time

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We're going beyond existing ICT technologies used for encouraging behavioural change towards more energy-efficient ways of life.

concerning energy conservation, security and health-related issues. Notifications are sent to motivate end users in embracing more energy-efficient, safe and healthy habits.

High user acceptance for platform

The InBetween team performed an interim analysis to understand the extent of the change in energy consumption following the platform's implementation. About 38 % of the buildings that downloaded the app showed a significant reduction in energy use, compared to 33 % the previous year.

An analysis of over 2 000 notification and triggering events sent in the early months of 2020 shows an excellent response rate to the platform by end users. Interviews with users and feedback also indicate a high level of satisfaction with use.

A photo contest has been launched asking people about smart habits that help save energy and money at home. It will also raise awareness about the platform's various services. The competition runs until 15 September.

PROJECT
InBetween – ICT enabled BEhavioral change ToWards Energy EfficieNt lifestyles

COORDINATED BY
RINA Consulting SPA, Italy

FUNDED UNDER
H2020

CORDIS FACTSHEET
cordis.europa.eu/project/id/768776

PROJECT WEBSITE
inbetween-project.eu/

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Awareness and gamification motivate positive energy efficiency behaviour

The push for more efficient consumption and use of resources could mean less stress on the environment and better quality of life. An EU-funded innovation action has provided fun and engaging means for us to do our part through behavioural changes in energy use.

Introducing the enCOMPASS project, coordinator Piero Fraternali emphasises: "People need to understand how and why they are consuming resources in order to identify the inefficient behaviours that need to be changed."

To support this, project partners first researched the factors driving energy consumption in households, schools and public places and they identified problems related to awareness and knowledge. Beliefs, attitudes, perceived responsibility, intentions

© funergy

Fun and sustainability across the board

The Funergy game and project pilots were validated with a large number of users in diverse situations in households, schools and public buildings in Germany, Greece and Switzerland. Over 1 500 elementary and middle school students from 10 schools participated in Funergy play sessions in Italy and Switzerland.

and motivations were also found to play an important role in energy behaviours. "All of these elements are behavioural predictors and, by modifying them, a more sustainable behaviour can be induced," Fraternali explains.

Efficiency and learning across domains and platforms

enCOMPASS itself proved efficient in its use of resources, leveraging positive outcomes achieved by the SmartH2O project in relation to behavioural change in the water domain. The consortium adapted and applied similar strategies to energy consumption. It developed and provided a set of tools enabling people to understand and improve their consumption efficiency. The tools supporting this "playful and collaborative learning," as Fraternali underscores, include intelligent data visualisation, contextual energy saving recommendations, educational content and gamified conservation goals.

The enCOMPASS mobile app offers multiple energy awareness functions and makes recommendations for saving energy: for example, to set the thermostat to a lower level. Users can provide feedback on the recommendations and their comfort level, ultimately helping to improve the accuracy of recommendations. "The app was gamified to keep high levels of engagement and motivation to save energy," the coordinator reports. "A leader board enabled social comparison and competition, which are key elements for motivation."

Deserving of special mention in terms of engagement of young and old(er) alike is a hybrid digital-physical game available as both an Android and iOSapp. "The Funergy board game and digital app interact to challenge players in the implementation of cooperative and competitive strategies to acquire energy saving points." He continues: "Energy-related quizzes further deepen the knowledge and awareness of children and their families about environmental and energy issues."

Beyond a full listing of enCOMPASS deliverables and materials available to the public, project partners actively shared their efforts with audiences reaching into the thousands across various social media channels. Their more than 30 scientific publications will also push forward research in energy conservation behavioural interventions. Offline, enCOMPASS participated in several research and industry events during its 3-year life cycle, culminating in its final event at European Utility Week 2019.

"The tools we designed were received enthusiastically by the participants during the workshops and the playing sessions," Fraternali concludes. "It helped us understand that people are willing to get involved and participate in sustainability-related activities when they are provided with tools that are adequately designed considering their needs." The partners will now focus on executing the business plans created for the platform.

The Funergy board game and digital app interact to challenge players in the implementation of cooperative and competitive strategies to acquire energy saving points. Energy-related quizzes further deepen the knowledge and awareness of children and their families about environmental and energy issues.

PROJECT
enCOMPASS – Collaborative Recommendations and Adaptive Control for Personalised Energy Saving

COORDINATED BY
Polytechnic University of Milan, Italy

FUNDED UNDER
H2020

CORDIS FACTSHEET
cordis.europa.eu/project/id/723059

PROJECT WEBSITE
encompass-project.eu/

Smart application promotes energy efficiency and savings for households

Eco-friendly and smart behaviour do not have to be mutually exclusive, and can be as easy as using an application on a smartphone or tablet. An EU-funded project demonstrated a new application that helps users become more energy efficient and access cheaper tariffs.

Most European households don't know their daily or monthly electricity consumption – domestic energy use would often become visible to the user once per year. As a first step to overcome this problem, EU Member States have already committed to roll out smart meters that should cover at least 80 % of electricity consumers by 2020.

Smart meters allow accurate billing through communication (hourly or more frequently) between the electricity meters recording the actual consumption and the monitoring utility. The granular or detailed consumption data is then forwarded to the consumers, and this low-level feedback motivates them to adjust their habits to improve energy efficiency and therefore save money.

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Information technology solutions for energy markets and end users

A smartphone and tablet application for end-user energy management and savings developed by the EU-funded PEAKapp project increases integration of smart meters, enabling consumers to monitor their instant consumption and gauge how to use energy more efficiently. "Our key ambition was to develop a tool that allows household energy consumers to become an integral part of the energy transition. We targeted especially those who do not own photovoltaics, an electric car, or fancy home automation gear," notes project coordinator Johannes Reichl.

PEAKapp's smartphone application only requires a smart meter to be installed at home. Importantly, the application enables households to benefit from various new electricity tariff models. The tariff structures included offer discounts during peaks of electricity production from renewable energy resources as a way to enable households to reduce their personal carbon footprints. With PEAKapp serving as the interface between energy markets and households, citizens receive information about their electricity consumption and are able to access green electricity at times when the sun is shining or the wind blows.

Furthermore, the application works with social network integration and includes some games. "Consumers will be able to monitor their instant electricity consumption as well as learn to use energy in a more efficient manner and share their experiences on social networks. These comparative challenges offer greater transparency on how energy behaviour affects a household's carbon footprint," adds Reichl.

Empowering citizens' role in the clean energy transition

The project team carried out field tests in four different countries – Austria, Estonia, Latvia and Sweden – to assess the efficacy of the newly developed system. In total, more than 6 000 households used the application throughout the project lifetime. Almost 3 000 of them offered the project team access to their smart metered load profiles for detailed scientific analyses.

Our key ambition was to develop a tool that allows household energy consumers to become an integral part of the energy transition.

After 69 weeks of field testing, participating households were asked if using the app changed their behaviour and energy-related decision-making. The results showed that 40 % of users found that they spent more attention to the way energy is used in their household, 14 % of users replaced inefficient energy appliances with more efficient ones and 22 % percent said they changed their cooking/washing behaviour. Active users were able to decrease their daily electricity consumption by 7 %, on average.

"Field study results clearly demonstrated that a substantial proportion of household electricity consumers are willing to participate in the energy transition. They just need the right tools to engage with energy-related topics and their utility providers," explains Reichl.

This market-ready product promotes the vision of an energy system with citizens at its core. However, more time is still needed for households to realise their active role in the energy system and participate in local energy communities that foster joint utilisation of local renewable energy.

PROJECT

PEAKapp – Personal Energy Administration Kiosk application: an ICT-ecosystem for Energy Savings through Behavioural Change, Flexible Tariffs and Fun

COORDINATED BY
Energy Institute – Johannes Kepler University Linz, Austria

FUNDED UNDER
H2020

CORDIS FACTSHEET
cordis.europa.eu/project/id/695945

PROJECT WEBSITE
peakapp.eu/

Moving towards a world of energy-efficient buildings

While most of the energy used in buildings is used to maintain a comfortable indoor environment, saving on energy usage does not need to be at odds with lifestyle. An EU-funded project has a solution.

Today, the design and development of solutions for reduced energy consumption in buildings is paramount. There is a need for innovative solutions that are based on the adoption of energy-efficient techniques and the active engagement of citizens and occupants.

Leading the way

"The ENTROPY project sought to address this need by building upon the integration of technologies that facilitate the deployment of innovative energy-aware IT ecosystems for motivating end-users' behavioural changes," outlines Antonio Skarmeta Gómez, project coordinator. ENTROPY's energy IT ecosystem has done this by taking advantage of an opportunity related to the possibilities of an IoT-based platform, Big Data analytics, personalised recommendations, serious games and their potential in bringing improvement in energy efficiency. "Scientific evidence has shown us that a great deal of energy in buildings was due to inadequate behaviours. We also saw that there was a wave of IoT sweeping over buildings," adds Skarmeta Gómez.

How does it work?

The solution is activated when a campaign manager initiates an energy efficiency campaign through the ENTROPY platform. From there, they specify the building areas and in return receive a set of installed sensors per area. After this, data monitoring systems are triggered and stored in the ENTROPY repository in a standardised way.

Upon the collection of this data, a set of services are provided. The campaign manager produces energy and behavioural analytics. Then, based on the analysis of results and the profile of each user, personalised services and messages are sent to each user.

© Antonio Skarmeta

End users then use ENTROPY services through a personalised application or serious games on their smartphones. They will receive real-time data from sensors and recommendations for realising energy efficient action.

Key results

"The overall result of ENTROPY is the large amount of savings that could be made when incorporating the solution developed in this project." ENTROPY also showed how energy waste could be reduced.

The developments within this project have led to a variety of results in the years following its end. "New research that will help to create new knowledge in the field has been launched," outlines Skarmeta Gómez. For one, the coordinator of ENTROPY has received funding for the new PHOENIX project, which is expected to increase the specific mass of the group in the field of intelligent buildings, increasing even further their potential to generate innovation.

The ENTROPY project sought to address this need by building upon the integration of technologies that facilitate the deployment of innovative energy-aware IT ecosystems for motivating end-users' behavioural changes.

The project's know-how in the area of augmented reality and gamification has led to a collaborative effort resulting in funding for the project CONBOTS. Investigating a proposed paradigm shift, the initiative aims to augment handwriting and music learning through robotics.

The members of ENTROPY have also formed a plethora of collaborations with other European institutions, thanks to the projection and visibility that the project has given to them with many having published papers in their own groups.

"The project has also played a crucial role in the generation of innovation. The group from the University of Murcia has been selected for a spin-off programme which aims at starting the developments for the valorisation of intelligent controls of thermostats," concludes Skarmeta Gómez

PROJECT

ENTROPY – DESIGN OF AN INNOVATIVE ENERGY-AWARE IT ECOSYSTEM FOR MOTIVATING BEHAVIOURAL CHANGES TOWARDS THE ADOPTION OF ENERGY EFFICIENT LIFESTYLES

COORDINATED BY
University of Murcia, Spain

FUNDED UNDER
H2020

CORDIS FACTSHEET
cordis.europa.eu/project/id/649849

PROJECT WEBSITE
entropy-project.eu/

Supporting European schools towards sustainability awareness and energy efficiency

Raising awareness among young people and changing their behaviour and habits concerning energy usage is key to achieving sustained energy reduction and ultimately decreasing consumption in school buildings. To accomplish this, an EU initiative has created an innovative ICT ecosystem for greener schools.

The EU-funded GAIA project focused on the educational community, including staff, students and parents at various levels of education, from primary and secondary schools to universities. Aside from these users, it also took into account their school buildings across Europe. "Climate change and the need for Europe to respond to the challenges of this reality motivated

© GAIA

the project," says coordinator Georgios Mylonas. "We want to inspire students, teachers and parents so that they positively transform their behaviour concerning energy efficiency."

Targeting energy efficiency through educational communities

The GAIA team built and installed a large-scale Internet of things (IoT) infrastructure in 25 school buildings in Greece, Italy and Sweden. The digital ecosystem brought together students and educators across Europe. The main aim was to raise awareness about energy consumption and sustainability based on real-world sensor data produced inside school buildings where students and teachers study and work. Team members used such data as a basis for integrating sustainability and energy-focused educational activities into the schools' curricula.

GAIA's environmental sustainability education and energy efficiency awareness initiatives made students understand that energy consumption is largely influenced by the sum of individual behaviours in places like the school and home, and helped them to achieve substantial energy savings in practice.

The IoT infrastructure installed in these buildings monitors their power consumption in real time, as well as several indoor and outdoor environmental parameters. A set of tools allows access to the data produced and provides functionality to support educational activities that were co-created in collaboration with participating schools and educators. The playful platform GAIA Challenge introduces students to aspects related to power consumption and energy savings. In addition, real-time data from sensors in the buildings and participatory sensing help to visualise the real-life impact of students' behaviour and enable competitive gamification elements among different schools.

Over 3 000 students and 200 educators participated directly in GAIA's activities throughout the duration of the project, helping to achieve energy savings by changing their behaviour. According to surveys conducted at participating schools before the project ended, 75 % of the students responded that GAIA had a positive influence on them. In terms of actual energy savings, results in the 15-20 % range were obtained in several schools. This was

achieved by focusing on the part of energy consumption that can be affected by end users, while trying not to disrupt the normal operation of the schools.

Fostering a culture of energy-efficient living

"With respect to community engagement, an important factor has been competition," explains Mylonas. "Students were intrigued by the prospect of competing with their peers from other schools and countries and were further motivated to participate in GAIA's competitions for energy savings and related ideas." Findings show that gamification and competition between schools across Europe can have very beneficial effects on student engagement during in-class sustainability and energy-related activities and can contribute significantly to the success of similar initiatives.

The school network and the developed software tools remained active during the 2019/2020 academic year. Manuals and educational materials available on the project website allowed schools and educators to exploit the outcomes regardless of location.

"GAIA's environmental sustainability education and energy efficiency awareness initiatives made students understand that energy consumption is largely influenced by the sum of individual behaviours in places like the school and home, and helped them to achieve substantial energy savings in practice," concludes Mylonas. "Changing their behaviour and adopting simple interventions in these settings can have tremendous impact on achieving energy savings."

The consortium continues to actively pursue new partnerships with schools and the expansion of the network formed during the project, with two new schools added in the months following the project's end.

PROJECT
GAIA – Green Awareness in Action

COORDINATED BY
The Computer Technology Institute and Press "Diophantus" (CTI), Greece

FUNDED UNDER
H2020

CORDIS FACTSHEET
cordis.europa.eu/project/id/696029

PROJECT WEBSITE
gaia-project.eu/index.php/en/homepage-3/

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RESULTS PACK ON CLIMATE NEUTRALITY

In this Results Pack, we feature eight EU-funded projects that are highlighting how policies and financing initiatives can steer the EU towards climate neutrality by embracing the complex interplay between the energy system, the economy and consumer behaviour.

CORDIS Results Pack on climate neutrality
A thematic collection of innovative EU-funded research results

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Pathways for achieving the European Green Deal objectives

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